UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

2008

SAMPLE COSTS TO PRODUCE

FIELD CORN

ON MINERAL SOILS
IN THE
SACRAMENTO VALLEY

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CONTENTS

INTRODUCTION

The sample costs to produce field corn in the Sacramento Valley are presented in this study. The study is intended as a guide only, and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. Practices described are based on those production procedures considered typical for this crop and area. Sample costs for labor, materials, equipment, and custom services are based on current figures. Some costs and practices detailed in this study may not be applicable to your situation. A blank column, "*Your Costs,*" is provided to enter your actual costs on Tables 1 and 2.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, 530-752-2414 or your local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, 530-752-2414. Current studies can be obtained from selected county UC Cooperative Extension offices or downloaded from the department website at http://coststudies.ucdavis.edu.

ASSUMPTIONS

The following assumptions pertain to sample costs to produce field corn in the Sacramento Valley. Practices described should not be considered recommendations by the University of California, but rather represent production procedures considered typical for this crop and area. Some practices listed may not be needed nor used during every production year. Additional ones not indicated may be needed. Cultural practices for the production of field corn vary by grower and region, and variations can be significant. The practices and inputs used in the cost study serve only as a sample or guide. The costs shown are on an annual, per acre basis. **The use of trade names in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products**.

Land. This report is based on a 2,900 acre field and row crop farm. Field corn is planted on 600 acres and the other 2,300 acres, planted in rotation with the corn, processing tomatoes, alfalfa hay, rice, safflower, sunflower, dry beans and/or wheat. Typically, a grower with this amount of corn acreage will have several non-adjacent fields. A charge for equipment moving and set-up is shown in the tables under cultural costs. The entire 600 acres which is rented includes developed wells and irrigation system. All costs associated with land and the irrigation system is incurred by the landowner. The grower also owns land, a shop and an equipment yard.

CULTURAL PRACTICES AND MATERIAL INPUTS

Land Preparation. Primary tillage which includes laser leveling, discing, rolling, subsoiling, land leveling, and listing beds is in October of the year preceding planting. All operations are done on 100% of the acres unless noted. To reduce annual expenses, only 25% of the acreage is laser leveled each year. Subsoiling to a depth of 22 to 24 inches and discing are done on 25% (150 acres) of the corn acreage. Ground is smoothed in two passes with a triplane. Beds on 2.5 foot centers are made with a six-row lister, and shaped with a bed-shaper cultivator. Some growers may use other row configurations including three rows on 60 inch centers.

Stand Establishment. Field corn is generally planted from late March through April. In this study 36,000 seeds per acre are planted in April. An herbicide resistant variety is used.

Fertilization. Nitrogen is the primary nutrient applied to corn throughout the growing season. At planting 151 pounds (15 gallons) of ammonium phosphate (10-34-0) plus one quart of chelated zinc is applied. This is equivalent to 15 pounds of actual nitrogen and 51 pounds of phosphorous (P_2O_5) per acre. Aqua Ammonia (20-0-0) is applied at a rate of 225 pounds (152 gallons) of N per acre.

Irrigation. In this study, water is calculated to cost $19.56 per acre foot and is a combination of 1/2 well water and 1/2 canal delivered surface water. The irrigation costs shown in Tables 1, 2, and 3 include water, pumping, and labor charges. A total of 3 and a half acre-feet (42 acre inch) are applied to the crop in this study. A single pre-irrigation of 6.0 acre-inches (when needed) and six post-plant irrigations are applied bi-weekly in April, May, June, and July.

Pesticide Recommendations. Not all treatments mentioned in this report will be needed every year. Other materials other than those discussed in this report are available for labeled use on this crop. For specific pesticides choices and rates consult the publication UC IPM Pest Management Guidelines, Corn or can be accessed online at http://www.ipm.ucdavis.edu/PMG/crops-agriculture.html. Written

recommendations made by licensed pest control advisors are required for many pesticides. For information and pesticide use permits, contact the local county Agricultural Commissioner's office.

Weeds. A mix of materials and cultural practices are used to manage weeds in corn. Beginning in February a contact herbicide, Roundup, is applied by aircraft to the fallow beds to control early season weeds. For broadleaf weed control, Shark herbicide is applied in May on 25% of the corn acreage by the grower using a tractor mounted sprayer. Roundup is also used in May for additional grass weed control. Cultivation using a rolling or mechanical cultivator is done twice, once in March and once in May. The May cultivation is done as part of the furrowing out and fertilizing operation. Many growers are utilizing precision weed control with a gps unit installed on the tractor.

Insects and Diseases. Corn has many insect and mite pests that can cause economic damage during any given season. In this study cutworms (*Agrotis spp., Feltia spp.,* and *Peridroma spp*.) are assumed to be above the treatment threshold on 20% of the acreage. Sevin bait is applied to control cutworms on the infested acres. A tractor mounted applicator is used to apply the bait in May. Mites (*Tetranychus spp*.) can be a problem late in the season, and may be controlled with an application of Oberon sprayed on 60% of the acres in June. The mite treatment is applied by air.

Harvest. It is assumed that the grower owns a harvest combine and bankout wagon. The combine attaches to a 30-inch row, six-row header. The corn is dumped from the combine directly into the bankout wagon which transports the grain to semi-truck bulk grain trailers for transport to the buyer. Transportation from the field to the warehouse is paid by the buyer.

Equipment for harvest operations are shown in investment costs on Table 4, and labor, fuel, repairs, and operating interest, are calculated as harvest costs in Tables 1 and 3. If a grower contracts his harvest operation, all harvesting equipment should be subtracted from investment costs in Table 4. Related costs should be subtracted from harvest costs in Tables 1 and 3 and a custom charge added.

Yields. Annual field corn yields for individual counties in the Sacramento Valley from 1998 to 2007 range from a low of 3.40 tons per acre to a high of 6.85. This is the average of the 10 years weighted average (1998-2007). The reporting counties are Butte, Colusa, Glenn, Sacramento, Solano, Sutter, Tehama Yolo, and Yuba counties. The 10-year weighted average corn yield over that same period and region is 5.12. The yield used in this study is 6.0 tons per acre to reflect best management practices. Weighted average valley yields are shown in Table A.

Returns. Individual county average prices for field corn ranged from $80 to $126 per ton over the last ten years. Return prices to growers in the Sacramento Valley over the last 10 years are shown in Table A and a weighted average return of $94.29 was calculated. Because of a large increase in corn prices for the last two years, a price of $170.00 per ton is used.

Table A. Sacramento Valley weighted average field corn yield and price*

Year	Tons Per Acre	$ Per Ton
2007§	4.89	NA
2006	4.81	114.40
2005	5.03	95.15
2004	5.49	96.74
2003	5.11	96.90
2002	5.48	95.19
2001	5.24	82.04
2000	5.56	88.34
1999	4.96	86.36
1998	4.64	93.50
Annualized	**5.12**	**94.29**

* Source: California Crop Reports, 1998 – 2007
§ Preliminary report

Labor. Labor rates of $15.72 per hour for machine operators and $10.88 for general labor includes payroll overhead of 36%. The basic hourly wages are $11.55 for machine operators and $8.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers'

compensation insurance for field crops (code 0171), and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2008 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 1 and 4 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Interest on Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 6.75% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge. To prevent a negative calculation in this study, interest is calculated based on an August harvest. The monthly interest is then distributed in Table 4 beginning in September after the August harvest, which corresponds to the month following the August harvest date.

Equipment Cash Costs. Equipment costs fall into three categories; capital recovery, cash overhead, and operating costs. The cash overhead and capital recovery costs will be discussed in later sections. The operating costs consist of fuel, lubrication, and repairs.

Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO hp, and type of fuel used. The fuel and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time (Operation Time) for a given operation to account for fueling, moving equipment, and setup time. Prices for on-farm delivery of diesel and gasoline are $3.54 and $3.57 per gallon, respectively.

Risk. Risks associated with field corn production are not assigned a production cost. While this study makes an effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of corn production. Because of the risk involved, growers should consider all of the agronomic and economic risks before committing resources to corn production in the Sacramento Valley. Crop insurance may be a viable option that each grower should review to determine if it is appropriate for their situation.

CASH OVERHEAD

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, equipment repairs, and management.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.74% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $1,438 for the entire farm or $0.50 per acre.

Office Expense: Office and business expenses are estimated at $16.69 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc. Cash overhead costs are found in Tables 1, 2, 3 and 4.

Share Rent. Leasing practices and rental rates for agricultural property are continually being adjusted due to changing production and market economics, land values, and relative bargaining positions of the landlord and tenant. Land used for corn production in the Sacramento Valley is commonly rented on a tenant-landowner basis with the landowner receiving between 18-25% of the gross income. In this study the landowner receives 18% of the gross crop receipts from the sale of 6.0 tons of corn. The share rent calculated using a $170.00 per ton return price provides the landowner $183.60 per acre. The tenant pays all cash costs to produce the crop except for the landowner's share of grain drying costs if required.

Salary. Supervisor salaries, including benefits, are $117,465 per year for two supervisors and are allocated among the farm's other crops on a gross returns basis. In this study it is assumed that field corn provides 16% of the farm's gross returns. Any returns above total costs are considered returns to investment.

NON-CASH OVERHEAD COSTS

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is

$$\left[\left(\underset{\text{Price}}{Purchase} - \underset{Value}{Salvage}\right) \times \left(\underset{Factor}{\overset{Capital}{\text{Recovery}}}\right)\right] + \left[\underset{Value}{Salvage} \times \underset{Rate}{Interest}\right]$$

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the ASAE based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE, by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate.
Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. The interest rate of 4.25% used to calculate capital recovery cost is an interest rate from an agricultural lender. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Irrigation System. The fields are irrigated using a flood irrigation system. Water is delivered from a pump and district ditch and distributed by way of surface mainlines and valves. The life of the irrigation system is estimated at 40 years. The irrigation system is considered an improvement to the property and is shown in the capital recovery sections of Tables 1-3 and the Investments portion of Table 5.

Shop Building. The shop building is an 8,000 square foot metal building or buildings on a cement slab.

Shop Tools. This includes an assortment of shop tools.

Fuel Tanks. Two 4,000-gallon fuel tanks using electric pumps are used to hold diesel and gasoline. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

Table Values. Due to rounding, the totals may be slightly different from the sum of the components.

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Table 1.

UC COOPERATIVE EXTENSION
COSTS PER ACRE TO PRODUCE FIELD CORN
SACRAMENTO VALLEY – 2008
ON MINERAL SOILS

Labor Rate: $15.72/hr. machine labor
$10.88/hr. non-machine labor

Interest Rate: 6.75%
Yield per Acre: 6.0 Ton

Operation	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
		---------- Cash and Labor Costs per Acre ----------					
Cultural:							
Disc Field – on 25% of Acreage	0.02	0	3	0	0	3	
Subsoil – on 25% of Acreage	0.05	1	6	0	0	7	
Land Plane Field - 2X	0.28	5	17	0	0	22	
List Beds	0.15	3	6	0	0	9	
Apply Fallow Herbicide	0.00	0	0	12	9	21	
Cultivate Beds	0.20	4	8	0	0	12	
Pre-irrigate – on 20% of Acreage	0.00	0	0	3	0	3	
Plant Corn & Apply Fertilizer	0.16	3	8	116	0	127	
Break Crust – on 10% of Acreage	0.02	0	0	0	0	1	
Open Ditch - 2X	0.10	2	5	0	0	7	
Irrigate - 6X	7.50	82	0	96	0	178	
Close Ditch - 2X	0.10	2	4	0	0	6	
Insect Control - Cutworms on 20% of Acreage	0.03	1	1	2	0	3	
Cultivate & Sidedress Fertilizer	0.29	5	12	125	3	146	
Weed Control - Glyphosate	0.13	2	3	12	0	17	
Weed Control - Grasses on 25% of Acreage	0.13	2	3	1	0	6	
Postharvest - Chop Stubble	0.25	5	11	0	0	16	
Postharvest - Disc Stubble	0.22	4	23	0	0	27	
Pickup Truck Use	0.13	5	3	0	0	9	
ATV Use	0.10	2	0	0	0	2	
TOTAL CULTURAL COSTS	9.86	129	115	366	12	622	
Harvest:							
Combine Corn	0.22	4	17	0	0	21	
Bankout Grain	0.22	4	9	0	0	14	
TOTAL HARVEST COSTS	0.44	8	26	0	0	35	
Interest on Operating Capital @ 6.75%						19	
TOTAL OPERATING COSTS/ACRE		137	141	366	12	676	
CASH OVERHEAD:							
Liability Insurance						1	
Office Expense						19	
Supervisor Salary						31	
Share Rent @ 18% of Gross Returns						184	
Field Sanitation						1	
Property Taxes						3	
Property Insurance						3	
Investment Repairs						4	
TOTAL CASH OVERHEAD COSTS						245	
TOTAL CASH COSTS/ACRE						921	
NON-CASH OVERHEAD:							
Investment		Per producing Acre		-- Annual Cost -- Capital Recovery			
Fuel Tanks & Pumps		9		1		1	
Fuel Wagon		1		0		0	
Truck Tractor		15		1		1	
Trailer - Lowbed		3		0		0	
Trailer - Pipe		1		0		0	
Shop Building		71		5		5	
Shop Tools		5		0		0	
Storage Building		11		1		1	
Closed Mix System		2		0		0	
Pipe - Main Line		25		3		3	
Siphon Tubes		4		0		0	
Tool Carrier		7		1		1	
Portable Pump		9		1		1	
Forklift - 4 Ton		3		0		0	
Equipment		419		42		42	
TOTAL NON-CASH OVERHEAD COSTS		585		56		56	
TOTAL COSTS/ACRE						977	

Table 2.

UC COOPERATIVE EXTENSION
COSTS AND RETURNS PER ACRE TO PRODUCE FIELD CORN
SACRAMENTO VALLEY – 2008
ON MINERAL SOILS

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Corn For Grain	6.00	Ton	170.00	1,020	
TOTAL GROSS RETURNS FOR CORN				1,020	
OPERATING COSTS					
Herbicide:					
Roundup Weathermax	44.00	FlOz	0.54	24	
Shark	0.08	Oz	8.20	1	
Custom:					
Air Application	1.00	Acre	9.25	9	
Irrigation:					
Water	37.20	AcIn	2.67	99	
Seed:					
Seed Corn (Herbicide Resistant Variety)	36.00	Thou	2.24	81	
Fertilizer:					
10-34-0	151.00	Lb	0.223	34	
Zinc Chelate 6%	2.00	Pint	0.913	2	
20-0-0 (Aqua)	225.00	Lb N	0.555	125	
Insecticide:					
Sevin 5 Pellets	2.00	Lb	0.81	2	
Rent:					
Rig to Inject Aqua	1.00	Acre	3.00	3	
Labor (machine)	3.53	Hrs	15.72	55	
Labor (non-machine)	7.50	Hrs	10.88	82	
Fuel - Gas	0.83	Gal	3.57	3	
Fuel - Diesel	27.83	Gal	3.54	99	
Lube				15	
Machinery repair				25	
Interest on Operating Capital @ 6.75%				19	
TOTAL OPERATING COSTS/ACRE				676	
NET RETURNS ABOVE OPERATING COSTS				344	
CASH OVERHEAD COSTS:					
Liability Insurance				1	
Office Expense				19	
Supervisor Salary				31	
Share Rent @ 18% of Gross Returns				184	
Field Sanitation				1	
Property Taxes				3	
Property Insurance				3	
Investment Repairs				4	
TOTAL CASH OVERHEAD COSTS/ACRE				245	
TOTAL CASH COSTS/ACRE				921	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY)					
Fuel Tanks & Pumps				1	
Fuel Wagon				0	
Truck Tractor				1	
Trailer - Lowbed				0	
Trailer - Pipe				0	
Shop Building				5	
Shop Tools				0	
Storage Building				1	
Closed Mix System				0	
Pipe - Main Line				3	
Siphon Tubes				0	
Tool Carrier				1	
Portable Pump				1	
Forklift - 4 Ton				0	
Equipment (Listed in Tables 4 & 5)				42	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				56	
TOTAL COSTS/ACRE				977	
NET RETURNS ABOVE TOTAL COSTS				43	

Table 3.

U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS
SACRAMENTO VALLEY – 2008
ON MINERAL SOILS

Beginning OCT 07	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Ending SEP 08	07	07	07	08	08	08	08	08	08	08	08	08	
Cultural:													
Disc Field – on 25% of Acreage	3												3
Subsoil – on 25% of Acreage	7												7
Land Plane Field - 2X	22												22
List Beds	9												9
Apply Fallow Herbicide					21								21
Cultivate Beds							12						12
Pre-irrigate – on 20% of Acreage							3						3
Plant Corn & Apply Fertilizer							127						127
Break Crust - 10% of Acreage							1						1
Open Ditch - 2X								7					7
Irrigate - 6X							30	30	59	59			178
Close Ditch - 2X								3			3		6
Insect Control - Cutworms on 20% of Acreage								3					3
Cultivate & Sidedress Fertilizer								146					146
Weed Control - Glyphosate								17					17
Weed Control - Grasses on 25% of Acreage								6					6
Postharvest - Chop Stubble												16	16
Postharvest - Disc Stubble												27	27
Pickup Truck Use	1	1	1	1	1	1	1	1	1	1	1	1	9
ATV Use	0	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL CULTURAL COSTS	42	1	1	1	22	1	173	213	60	60	4	44	622
Harvest:													
Combine Corn												21	21
Bankout Grain												14	14
TOTAL HARVEST COSTS												35	35
Interest on Operating Capital @ 6.75%	0	0	0	0	0	0	1	3	3	3	3	4	19
TOTAL OPERATING COSTS/ACRE	43	1	1	1	22	1	175	215	63	63	7	82	676
CASH OVERHEAD:													
Liability Insurance				1									1
Office Expense	2	2	2	2	2	2	2	2	2	2	2	2	19
Supervisor Salary	3	3	3	3	3	3	3	3	3	3	3	3	31
Share Rent @ 18% of Gross Returns												184	184
Field Sanitation	0	0	0	0	0	0	0	0	0	0	0	0	1
Property Taxes				2						2			3
Property Insurance				1						1			3
Investment Repairs	0	0	0	0	0	0	0	0	0	0	0	0	4
TOTAL CASH OVERHEAD COSTS	5	5	5	8	5	5	5	5	5	8	5	188	245
TOTAL CASH COSTS/ACRE	47	6	6	9	27	6	179	220	68	71	12	270	921

UC COOOPERATIVE EXTENSION

Table 4. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
SACRAMENTO VALLEY – 2008
ON MINERAL SOILS

ANNUAL EQUIPMENT COSTS

						- Cash Overhead -		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
08	135 HP 2WD Tractor	93,965	10	27,756	9,445	450	609	10,503
08	165 HP 2WD Tractor	109,126	10	32,234	10,968	523	707	12,198
08	200 HP Crawler	185,798	10	54,882	18,675	891	1,203	20,769
08	340 HP Crawler	204,262	10	60,336	20,530	979	1,323	22,833
08	425 HP Crawler	237,939	10	70,283	23,916	1,140	1,541	26,597
08	90 HP 2WD Tractor	48,274	10	14,259	4,852	231	313	5,396
08	ATV - 4WD	5,252	5	2,354	756	28	38	822
08	Bait Applicator	2,712	12	376	269	11	15	295
08	Bankout Wagon - 30 Ton Pull Type	19,532	10	3,454	2,154	85	115	2,354
08	Combine with No Header	187,283	15	19,179	16,200	764	1,032	17,996
08	Corn Header - 6 Row	33,884	10	6,392	3,703	149	201	4,054
08	Cultivator - Rolling 6 Row	5,675	12	786	562	24	32	618
08	Cultivator - 6 Row	10,213	12	1,415	1,011	43	58	1,112
08	Disc - Stubble 18'	53,619	10	9,482	5,913	233	316	6,462
08	Disc - Finish 25'	48,129	12	6,666	4,766	203	274	5,242
08	Ditcher - V	9,285	12	1,286	919	39	53	1,011
08	Lister - 6 Row	1,900	12	263	188	8	11	207
08	Mower - Flail 15'	13,852	10	2,450	1,527	60	82	1,669
08	Pickup 1/2 Ton	24,969	5	11,190	3,592	134	181	3,907
08	Pickup 3/4 Ton	30,155	5	13,515	4,338	162	218	4,718
08	Planter - 6 Row	17,872	10	3,161	1,971	78	105	2,154
08	Ringroller - 32'	8,655	12	1,199	857	36	49	943
08	Saddle Tank - 300 Gal	2,553	10	451	282	11	15	308
08	Scraper - Drag 10'	2,608	18	174	204	10	14	228
08	Sprayer System	4,405	10	779	486	19	26	531
08	Subsoiler - 9 Shank	38,300	10	6,773	4,223	167	225	4,615
08	Triplane - 16'	21,589	12	2,990	2,138	91	123	2,352
	TOTAL	1,421,806		354,085	144,444	6,571	8,879	159,894
	60% of New Cost *	853,084		212,451	86,666	3,942	5,328	95,937

*Used to reflect a mix of new and used equipment

ANNUAL INVESTMENT COSTS

					------ Cash Overhead ------			
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Repairs	Total
INVESTMENT								
Closed Mix System	5,042	10	504	588	21	28	139	775
Forklift - 4 Ton	9,481	10	948	1,105	39	52	190	1,386
Fuel Tanks & Pumps - 2	26,049	20	2,605	1,874	106	143	716	2,839
Fuel Wagon	2,594	10	259	302	11	14	71	398
Pipe - Main Line	72,115	10	7,212	8,408	294	397	1,983	11,082
Portable Pump	24,728	10	2,473	2,883	101	136	680	3,800
Shop Building - 8,000 SqFt	206,688	25	20,669	13,103	841	1,137	5,684	20,765
Shop Tools	13,595	20	1,360	978	55	75	272	1,380
Siphon Tubes	12,646	15	1,265	1,095	51	70	348	1,564
Storage Building	33,270	20	3,327	2,394	135	183	915	3,627
Tool Carrier	19,119	15	1,912	1,656	78	105	525	2,364
Trailer - Lowbed	10,106	15	1,011	875	41	56	278	1,250
Trailer - Pipe	2,446	7	245	381	10	13	67	471
Truck Tractor	44,704	15	4,470	3,872	182	246	309	4,609
TOTAL INVESTMENT	482,583		48,260	39,515	1,964	2,654	12,177	56,311

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Field Sanitation	2,900	Acre	0.86	2,494
Liability Insurance	2,900	Acre	0.50	1,450
Office Expense	2,900	Acre	18.97	55,013
Share Rent @ 18% of Gross Returns	600	Acre	183.60	110,160
Supervisor Salary	600	Acre	31.32	18,792

Table 5. HOURLY EQUIPMENT COSTS

			---------- COSTS PER HOUR ----------						
		Actual		- Cash Overhead -		-------- Operating --------			
Yr	Description	Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
08	135 HP 2WD Tractor	1,199.6	4.72	0.23	0.30	4.41	31.90	36.31	41.56
08	165 HP 2WD Tractor	1,200.0	5.48	0.26	0.35	5.12	38.98	44.10	50.20
08	200 HP Crawler	1,599.2	7.01	0.33	0.45	4.99	47.25	52.24	60.03
08	340 HP Crawler	1,599.2	7.70	0.37	0.50	5.48	80.33	85.81	94.37
08	425 HP Crawler	1,599.2	8.97	0.43	0.58	6.38	100.40	106.78	116.76
08	90 HP 2WD Tractor	1,230.8	2.37	0.11	0.15	2.27	18.39	20.66	23.29
08	ATV - 4WD	285.0	1.59	0.06	0.08	0.34	4.11	4.45	6.18
08	Bait Applicator	100.0	1.61	0.07	0.09	1.05	0.00	1.05	2.82
08	Bankout Wagon - 30 Ton Pull Type	200.0	6.46	0.26	0.34	2.71	0.00	2.71	9.77
08	Combine with No Header	200.2	48.55	2.29	3.09	13.40	50.80	64.20	118.14
08	Corn Header - 6 Row	200.0	11.11	0.45	0.60	6.44	0.00	6.44	18.61
08	Cultivator - Rolling 6 Row	166.0	2.03	0.09	0.12	1.20	0.00	1.20	3.43
08	Cultivator - 6 Row	192.0	3.16	0.13	0.18	2.16	0.00	2.16	5.64
08	Disc - Stubble 18'	200.0	17.74	0.70	0.95	8.90	0.00	8.90	28.29
08	Disc - Finish 25'	153.9	18.58	0.79	1.07	7.88	0.00	7.88	28.31
08	Ditcher - V	166.0	3.32	0.14	0.19	2.60	0.00	2.60	6.26
08	Lister - 6 Row	166.0	0.68	0.03	0.04	0.40	0.00	0.40	1.15
08	Mower - Flail 15'	200.0	4.58	0.18	0.24	5.88	0.00	5.88	10.89
08	Pickup 1/2 Ton	285.0	7.56	0.28	0.38	1.63	10.26	11.89	20.12
08	Pickup 3/4 Ton	285.0	9.13	0.34	0.46	1.97	12.32	14.29	24.22
08	Planter - 6 Row	150.0	7.88	0.31	0.42	4.97	0.00	4.97	13.58
08	Ringroller - 32'	166.0	3.10	0.13	0.18	0.99	0.00	0.99	4.40
08	Saddle Tank - 300 Gal	150.0	1.13	0.04	0.06	0.69	0.00	0.69	1.92
08	Scraper - Drag 10'	166.0	0.74	0.04	0.05	0.39	0.00	0.39	1.21
08	Sprayer System	177.4	1.64	0.06	0.09	1.19	0.00	1.19	2.98
08	Subsoiler - 9 Shank	170.0	14.91	0.59	0.80	8.78	0.00	8.78	25.07
08	Triplane - 16'	250.6	5.12	0.22	0.29	3.31	0.00	3.31	8.94

Table 6.

UC COOPERATIVE EXTENSION
RANGING ANALYSIS
SACRAMENTO VALLEY - 2008

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE FIELD CORN FOR GRAIN

	YIELD (ton/acre)						
	4.5	5.0	5.5	6.0	6.5	7.0	7.5
OPERATING COSTS/ACRE:							
Cultural Cost	622	622	622	622	622	622	622
Harvest Cost	26	29	32	35	38	40	43
Interest on Operating Capital	19	19	19	19	19	19	19
TOTAL OPERATING COSTS/ACRE	667	670	673	676	679	682	685
TOTAL OPERATING COSTS/TON	148	134	122	113	104	97	91
CASH OVERHEAD COSTS/ACRE	245	245	245	245	245	245	246
TOTAL CASH COSTS/ACRE	912	915	918	921	924	927	930
TOTAL CASH COSTS/TON	203	183	167	154	142	132	124
NON-CASH OVERHEAD COSTS/ACRE	54	55	55	56	56	56	57
TOTAL COSTS/ACRE	966	970	973	977	980	983	987
TOTAL COSTS/TON	215	194	177	163	151	140	132

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR FIELD CORN FOR GRAIN

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Field Corn	4.5	5.0	5.5	6.0	6.5	7.0	7.5
	---------- $/ton ----------						
140	-37	30	97	164	231	298	365
150	8	80	152	224	296	368	440
160	53	130	207	284	361	438	515
170	98	180	262	344	426	508	590
180	143	230	317	404	491	578	665
190	188	280	372	464	556	648	740
200	233	330	427	524	621	718	815

NET RETURN PER ACRE ABOVE CASH COST FOR FIELD CORN FOR GRAIN

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Field Corn	4.5	5.0	5.5	6.0	6.5	7.0	7.5
	---------- $/ton ----------						
140	-282	-215	-148	-81	-14	53	120
150	-237	-165	-93	-21	51	123	195
160	-192	-115	-38	39	116	193	270
170	-147	-65	17	99	181	263	345
180	-102	-15	72	159	246	333	420
190	-57	35	127	219	311	403	495
200	-12	85	182	279	376	473	570

NET RETURNS PER ACRE ABOVE TOTAL COST FOR FIELD CORN FOR GRAIN

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Field Corn	4.5	5.0	5.5	6.0	6.5	7.0	7.5
	---------- $/ton ----------						
140	-336	-270	-203	-137	-70	-3	63
150	-291	-220	-148	-77	-5	67	138
160	-246	-170	-93	-17	60	137	213
170	-201	-120	-38	43	125	207	288
180	-156	-70	17	103	190	277	363
190	-111	-20	72	163	255	347	438
200	-66	30	127	223	320	417	513

Table 7.

UC COOPERATIVE EXTENSION
COSTS AND RETURNS/BREAKEVEN ANALYSIS
SACRAMENTO VALLEY - 2008

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Field Corn	1,020	676	344	921	99	977	43

COSTS AND RETURNS - TOTAL ACREAGE

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Field Corn	612,000	405,494	206,506	552,736	59,264	586,061	25,939

BREAKEVEN PRICES PER YIELD UNIT

			-------- Breakeven Price To Cover --------		
CROP	Base Yield (Units/Acre)	Yield Units	Operating Costs	Cash Costs	Total Costs
			---------- $ per Yield Unit ----------		
Field Corn	6.0	Ton	112.64	153.54	162.79

BREAKEVEN YIELDS PER ACRE

			-------- Breakeven Yield To Cover --------		
CROP	Yield Units	Base Price ($/Unit)	Operating Costs	Cash Costs	Total Costs
			---------- Yield Units / Acre ----------		
Field Corn	Ton	170.00	4.0	5.4	5.7

Table 8.

UC COOPERATIVE EXTENSION
DETAIL OF OPERATIONS – FIELD CORN
SACRAMENTO VALLEY - 2008

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Disc Field - 25% of Acreage	October	425 HP Crawler	Disc - Stubble 18'			
Subsoil - 25% of Acreage	October	425 HP Crawler	Subsoiler - 9 Shank			
Land Plane Field - 2X	October	200 HP Crawler	Triplane - 16'			
List Beds	October	135 HP 2WD Tractor	Lister - 6 Row			
Weed Control - Fallow Herbicide	February	Air Application			1.00	Acre
				Roundup Weathermax	22.00	FlOz
Cultivate Beds	April	135 HP 2WD Tractor	Cultivator - Rolling 6 Row			
Pre-irrigate - 20% of Acreage	April	Labor		Water	6.00	AcIn
Plant Corn & Apply Fertilizer	April	135 HP 2WD Tractor	Planter - 6 Row	Seed Corn (Herbicide Resistant)	36.00	Thou
			Saddle Tank - 300 Gal	10-34-0	151.00	Lb
				Zinc Chelate 6%	2.00	Pint
Break Crust - 10% of Acreage	April	90 HP 2WD Tractor	Ringroller - 32'			
Open Ditch - 2X	April	165 HP 2WD Tractor	Ditcher - V			
	May	165 HP 2WD Tractor	Ditcher - V			
Irrigate - 6X	April	Labor		Water	6.00	AcIn
	May	Labor		Water	6.00	AcIn
	June	Labor		Water	12.00	AcIn
	July	Labor		Water	12.00	AcIn
Close Ditch - 2X	April	135 HP 2WD Tractor	Scraper - Drag 10'			
	May	135 HP 2WD Tractor	Scraper - Drag 10'			
Insect Control -	May	135 HP 2WD Tractor	Cultivator - 6 Row	Sevin 5 Pellets	2.00	Lb
- Cutworms on 20% of Acreage			Bait Applicator			
Cultivate & Sidedress Fertilizer	May	135 HP 2WD Tractor	Rent Aqua Rig	20-0-0 (Aqua)	225.00	Lb N
			Cultivator - 6 Row			
Weed Control - Glyphosate	May	90 HP 2WD Tractor	Sprayer System	Roundup Weathermax	22.00	FlOz
Weed Control -	May	90 HP 2WD Tractor	Sprayer System	Shark	0.08	Oz
- Grasses on 25% of Acreage						
Combine Corn	September	Combine with No Header	Corn Header - 6 Row			
Bankout Grain	September	135 HP 2WD Tractor	Bankout Wagon - 30 Ton Pull Type			
Postharvest - Chop Stubble	September	135 HP 2WD Tractor	Mower - Flail 15'			
Postharvest - Disc Stubble	September	340 HP Crawler	Disc - Finish 25'			
Equipment Moving & Set Up	All	Labor			1.50	Hour
Pickup Use	All	Pickup - 1/2 Ton				
		Pickup - 3/4 Ton				
ATV Use	All	ATV - 4WD				